usual blue colouration. Further investigation revealed the fact that the blue colouration is due to an impurity in ordinary coal-tar benzene, viz. thiophene. The discovery of this remarkable substance was of great importance, giving a deeper insight into the nature of aromatic substances. Six years after the discovery of thiophene, he was able to publish a monograph "Die Thiophengruppe," containing a masterly account of thiophene and its derivatives, practically the whole of the work having been carried out in his own laboratory.

Another extremely interesting group of compounds, our knowledge of which is due to V. Meyer and his pupils, is that derived from the hypothetical iodonium hydroxide, $IH_2.OH$. In these substances the iodine plays a part analogous to that of nitrogen or sulphur in the ammonium and sulphonium compounds. The curious and striking resemblance of the corresponding diphenyl iodonium and thallium salts is very suggestive.

Many of his investigations related to the connection between the constitution of a substance and the relative ease with which it entered into a given reaction. As examples may be mentioned his work on the influence of certain groups on the acid properties of substances containing them, and that on the relative ease of etherification of substituted benzoic acids, and on the formation of oximes or hydrazones of aromatic ketones.

Victor Meyer's best-known work is certainly that on vapour-density. A description of his air-displacement method of determining vapour-density is to be found in almost every text-book of chemistry, and a specimen of his apparatus in almost every laboratory in the world. The method was devised in 1878, and since then hardly a year has elapsed in which he has not described some improvement of the apparatus, rendering it capable of more extended usefulness or some results, frequently of the highest interest, obtained by means of it. It is not easy to realise how little we would know of the molecular condition of vapours, especially at high temperatures, if Meyer's work in this direction were swept away. In a fascinating paper published in 1890, entitled "Chemische Probleme der Gegenwart," he gives rein to his scientific imagination, and discusses what might occur if it were possible to carry out vapour-density determinations at temperatures as much above the highest now reached as the latter are above the ordinary temperature.

In recent years he paid much attention to the study of chemical change in gaseous systems. The investigation of the reaction between iodine and hydrogen is particularly noteworthy as affording one of the very few examples known of a normal reaction between gases.

As a lecturer, Victor Meyer was equally admirable. He had a wonderful power of rapidly presenting a subject clearly to his students, and, at the same time, of impressing fundamental conceptions on their minds. He was never dogmatic; if there were two views current on any subject he carefully explained both of them, leaving his hearers to form their own opinions. The bearing of chemistry on practical matters was not forgotten; for example, when dealing with sugar he sketched the development of the German beet-sugar industry, and gave an account of the legislation connected with sugar bounties and its economic consequences. The experimental illustration of his lectures was extremely complete and carefully prepared. This was not only the case with the lectures on inorganic, but also with those on organic chemistry, the number of substances prepared in the latter being quite astonishing. To make this possible in cases where, for example, a prolonged heating was necessary, the beginning of the reaction was shown in one experiment, the end of it in another, which had been started before the lecture.

The "Lehrbuch der Organischen Chemie," by Victor Meyer and Paul Jacobson, the first part of which appeared in 1891, is written with that freshness which is hardly possible without an intimate personal acquaintance with the subject. It is especially valuable in these latter days, when the writing of text-books by men who take a foremost part in investigation is not so common as in the time when Berzelius, Liebig, Gerhard and Kekulé wrote their classical works.

NOTES.

The French Academy has just accepted the administration of M. Pierre Lasserre's legacy, now amounting to 576,450 francs. In accordance with the terms of the bequest, the capital sum will be divided in three parts, the interests upon which will be awarded to the author of the best literary work, for an important scientific discovery, and to the composer of the best musical work. The respective awards will be made by the French Academy, the Academy of Sciences, and the Academy of Fine Arts.

The Council of the Society of Arts have appointed the following Committee to investigate the causes of the deterioration of paper: Major-General Sir Owen Tudor Burne, G.C.I.E., K.C.S.I., Chairman of the Council; Sir William Anderson, K.C.B., F.R.S., Mr. Michael Carteighe, Mr. C. F. Cross, Sir John Evans, K.C.B., F.R.S., Dr. Richard Garnett, C.B., Dr. Hugo Müller, F.R.S., Dr. W. J. Russell, F.R.S., Mr. W. L. Thomas, Prof. J. M. Thomson, F.R.S., Mr. Henry R. Tedder, Dr. Quirin Wirtz, Sir Henry Trueman Wood, Secretary. In the course of a circular letter which has been sent to those who are interested in the preservation of paper, it is pointed out that many books of an important character are now printed upon paper of a very perishable nature, so that there is considerable risk of the deterioration and even destruction of such books within a limited space of time. This is believed to be especially true of books which are in constant use for purposes of reference, and are therefore liable to much handling. Although a great deal of investigation has been made into the subject in Germany, the matter appears to have attracted but little attention in this country. The Council of the Society of Arts therefore readily acceded to a proposal made to them, and appointed a Committee to inquire into and report upon the whole subject.

At Crevalcore, a small town situated on the outskirts of Bologna, there was to be unveiled yesterday, September 8, a bronze monument erected in honour of Marcello Malpighi, the celebrated Italian anatomist, botanist, and microscopist, the contemporary, amongst others, of Hooke, Grew, and Oldenburg, names famous in the early annals of our Royal Society. Malpighi's relations, indeed, with that Society were close and cordial throughout. His interesting correspondence with Henry Oldenburg, its first Secretary, and with men equally concerned in the "Improvement of Natural Knowledge," is carefully preserved in the Society's archives. Not only this, his autobiography, and many most important contributions to the anatomy of plants, and discoveries in physiology were published in London under the auspices of the Royal Society, notably "Anatome Plantarum" (1672), and "De Structura Glandularum conglobatarum" (1689), as well as his treatise on the Silkworm, "De Bombyce" (1669). On March 4, 1668, the Society elected Malpighi an honorary member, on the initiative of Oldenburg, and this compliment was in 1680 gracefully acknowledged by Malpighi in the shape of a present of his own portrait. In addition to the inauguration of a monument there will appear at Milan, almost immediately, "Malpighi e l' Opera sua," edited by Doctor Vallardi. Contributions to the volume have been made by Profs. Strasburger, Virchow, Haeckel, Kölliker, Weiss, and others, while Prof. Michael Foster, Sec.R.S., furnishes a note; and it will also include several hitherto unpublished letters between Malpighi and the Royal Society. A commemorative medal has been struck, bearing on the obverse the profile effigy of the anatomist, and date. The reverse has an oak garland with inscribed legend, "It fama per orbem." The programme of Wednesday's celebration included a "Commemorazione malpighiana" by Prof. Romiti, held at the Teatro Comunale, and a special performance of Massenet's "Manon." The Royal Society sent an address of congratulation to the President of the Committee. It nominated Dr. D. H. Scott, F.R.S., honorary keeper of the Jodrell Laboratory at Kew Gardens, as its representative, but at the last moment Dr. Scott was prevented by sudden indisposition from attending.

THE German Pharmaceutical Association has awarded the first Flückiger Memorial Medal to Mr. E. M. Holmes, Curator of the Pharmaceutical Society's Museums, in recognition of his services to botany and pharmacognosy.

THE eleventh International Congress of Orientalists opened at Paris on Monday, under the presidency of M. Rambaud, the French Minister of Public Instruction.

THE collections, notes, and apparatus of the Zoological Expedition sent by Columbia University to Alaska have all been lost in the *City of Mexico*, which was wrecked while attempting to enter Queen Charlotte Sound on August 4. The members of the expedition were rescued from the ship, but the results of their season's work have been entirely lost.

WE regret to announce the deaths of Mr. William Archer, F.R.S., librarian of the National Library of Ireland; Dr. T. Bogomoloff, professor of medical chemistry in the University of Kharkoff; Dr. John Braxton Hicks, F.R.S., one of the pioneers of British work on diseases of women, and a Fellow of the Royal Society since 1862.

THE *Lancet* announces the death of Dr. Holmgren, professor of physiology in the University of Upsala. Dr. Holmgren was born in 1831, and worked for many years under Brücke, Du Bois Reymond, and Helmholtz. He was appointed to the chair of Physiology in 1864, and had the honour of establishing the first physiological institute in Sweden. He was chiefly known in this country from his researches on colour-blindness and his plan of testing the colour sense by means of wools.

THE forty-second annual exhibition of the Royal Photographic Society is now in course of preparation. It will be opened to the public on Monday, September 27, and the Saturday previous there will be a private view, followed in the evening by a conversazione at which the President, the Earl of Crawford, K.T., F.R.S., and Council will receive the Fellows, Members, and their friends. The exhibition will be open daily from 10 to 5, and on Monday, Wednesday and Saturday evenings (when lantern slides will be shown) from 7 to 10; and will close on November 13.

AT the final meeting of the International Medical Congress at Moscow on August 26, the first award of the international prize instituted by the City of Moscow was made to M. Henri Dunant, of Geneva, for the services he has rendered to humanity in the part he has played in founding the Red Cross Societies. This triennial prize, to be awarded by successive international congresses, either for the best work upon medicine or hygiene, or for eminent services rendered to suffering humanity, will amount to 5000 francs (200*l.*), representing the interest at 4 per cent. on the capital of 16,450 roubles voted by the municipality.

IT is stated that a large quantity of instruments have arrived at Dover for use in connection with some experiments in telegraphing without wires. The arrangements include experiments from Fort Burgoyne to the north of Dover Castle and other parts of the surrounding country, which offers facilities for work of this character. From the results which have been attained elsewhere it is believed the system can be successfully applied to lightships. From the position at Dover the Goodwin lightships will be made the objects of experiments under the direction of Mr. W. H. Preece. The sending apparatus will be at Fort Burgoyne, and the receiving apparatus will be moved to different parts of the district.

MOST of the subjects of address and papers brought before the meeting of the British Medical Association at Montreal were of too technical a character to be usefully chronicled in these columns. On Wednesday, September 1, the eleven sections met in the several rooms assigned to them. In the section of Medicine, Dr. Stephen Mackenzie delivered an address on the influences that have determined the progress of medicine during the preceding two and a half centuries. Mr. Christopher Heath opened the proceedings in the section of Surgery by the delivery of an address on the teaching of surgery. In the section of Public Medicine the proceedings were opened by Dr. E P. Lachapelle, who described the progress in sanitation that had been effected in Canada down to the present time. Dr. R. M. Bucke, of London, Ontario, delivered the presidential address in the section of Psychology, on the evolution of the human mind since the days of prehistoric man. Among other addresses was one on "British Medicine in Greater Britain," by Dr. William Osler; "The Surgeon of Old in War," by Dr. W. Mitchell Banks, and "On the Progress and Results of Pathological Work," by Prof. W. Watson Cheyne. The meeting was brought to a close on September 3, with an address by Dr. Herman Biggs on the working of the health department of New York City, and the efforts made by that body to stamp out consumption. The social side of the meeting was very successful, both the members of the medical profession and private citizens displaying lavish hospitality. The Canadians appear to have done everything in their power to make this, the first meeting of the Association outside the United Kingdom, one of exceptional brilliancy in every respect. The McGill University conferred the honorary degree of Doctor of Laws on Lord Lister, Prof. Richet, Sir William Turner, Dr. Henry Barnes, Dr. Michael Foster, Dr. W. H. Gaskell, Mr. Christopher Heath, Prof. Alexander Macalister, Dr. R. Saundby, and Mr. C. G. Wheelhouse. A speech was made by Lord Aberdeen in his capacity as visitor of the University. Lord Lister, Prof. Richet, and Dr. Michael Foster returned thanks in suitable terms.

A FINE waterspout was seen off Cromer on Saturday last. Sir William Flower, who saw it from New Haven Court, says that the whole phenomena consisted of two distinct portions (1) The real waterspout; a column of water, soon dissipated into steam, rising from the sea, and caused, apparently, by a violent and greatly concentrated cyclonic action of the air. (2) A greatly elongated portion of the lower edge of an extremely dense black cloud which was hanging just over it attracted into the vortex. The two travelled along together in the direction of the prevailing wind, but the apex of the descending prolongation of the dark cloud always pointed to the centre of the ascending column, though its length, form, and direction varied from time to time.

SEVERAL sensational paragraphs have appeared in the daily press during the past few months as to an alleged method of converting silver into gold, said to have been discovered by Dr.

Stephen H. Emmens. From a letter by Dr. Emmens in the current number of the *Chemical News*, we understand he does not claim to be a modern alchemist, but merely to be able to obtain gold, or a substance which will pass muster for gold, from Mexican dollars. Four Mexican dollars were cut in halves at the U.S. Assay Office, at the request of Dr. Emmens, and four halves were assayed at the Office, with the result that no gold was found—at least, the amount was less than one part in ten thousand. The remaining set of halves of the coins "was treated in the Argentaurum Laboratory, without the addition of gold in any form, and the result was a relatively considerable production of a metal which answered to all the usual tests of gold, and was subsequently purchased as gold by the U.S. Assay Office." The weight of the gold obtained is not stated. Of course, it is possible to make the gold found the basis of very untrustworthy statements, and that appears to have been done. Apparently, however, Dr. Emmens disclaims responsibility of the newspaper reports, for what he now concludes is:—"Either some of the silver or copper in the dollars had been changed into gold or its simulacrum by my treatment; or the gold already existed in the dollars and was separated by my treatment, though not by the treatment in vogue at the U.S. Assay Office." Sir William Crookes has examined a specimen of argentaurum in the spectrograph; and he finds that it consists of gold with a fair proportion of silver and a little copper. No lines belonging to any other known element, and no unknown lines, were detected.

THE deaths from lightning in this country are, happily, very few, being only about 1 per million of the population per annum. Sometimes no sign of injury can be seen upon the victim, but in other cases marks are left upon the body, or clothes are scorched, and more than one case has been recorded where boots have been torn off the feet and nails driven out of the soles of the boots. Seldom, however, does it happen that lightning leaves such remarkable evidence of its transit as that disclosed at an inquest recently held at Hulford House, near Guildford, and reported in the *Lancet*. The evidence showed that on Wednesday, August 25, there had been a single flash of lightning and a clap of thunder, and about half an hour afterwards Major Jameson was found lying on his face in a field quite dead. Around him, in a radius of several yards, were his clothes and boots, which had been torn and scattered about in an extraordinary manner. The lightning appears to have struck him on the right side of the head, tearing his cap to pieces and burning his hair off. It then passed inside his collar down the front of his body and both legs into his boots, which were torn to pieces, and then passed into the ground, making a hole about eighteen inches in circumference and three inches deep. His collar was torn to pieces, the front of his shirt was rent into ribbons, the jacket and under-vest were literally torn to shreds, and the knickerbockers he was wearing were stripped from him and scattered on the ground. His stockings and gaiters were similarly torn in pieces, and on the boots the lightning had a remarkable effect. They were burst open, some of the brass eyelet-holes were torn out, nails were forced out, and the soles torn off. The skin had been torn off the chest, and the right leg was torn and blackened; blood was issuing from the mouth and right ear. It is difficult to account for these appalling effects, or to explain why the electric discharge should produce widely different results upon different occasions.

DR. G. HELLMAN, whose facsimile reproductions of old meteorological works are well known in this country, contributes to the *Zeitschrift der Gesellschaft für Erdkunde zu Berlin* a short paper on the beginnings of observations of terrestrial magnetism. He traces the earliest observations of magnetic declination along two distinct lines: one due to the interest excited amongst seamen by Columbus's discovery, on September 13, 1492, of the changes in the variation of the compass, and another due to landsmen's efforts to construct an accurate portable sundial. A list of ten determinations of magnetic declination is given, beginning with Georg Hartmann at Rome about 1510 (6° E.), and ending with Gerhard Mercator on the island of Walcheren about 1546. The work of the remarkable João de Castro seems by far the best: he gives decl. 7½° E. at Lisbon in 1538. The first English observations are those of William Borough, of Limehouse, published in his "Discourse of the Variation of the Compass or Magnetical Needle," &c., in the year 1581, now a very rare book.

WE have received from M. Durand-Gréville a paper entitled "Les grains et le burster d'Australie," being an excerpt from the *Annales* of the French Meteorological Office for 1895 (just published). This is one of a series of valuable discussions on violent squalls in various parts of the world, which it is the aim of M. Durand-Gréville to show are very similar in their nature, although differing in their name and in their secondary characteristics (temperature, humidity, &c.). He points out that there are two different kinds of barometric depressions: (1) where the variations of pressure, temperature, &c., are gradual; and (2) where these elements change abruptly along a radial line running nearly to the southwards. In the rear of the passage of this radial line from west to east an area of high pressure and violent winds obtain. It is to this special feature that M. Durand-Gréville has paid particular attention, and his views seem to be consistent with those adopted by investigators in this country and in Germany, when dealing with secondary and especially the so-called V-shaped depressions, which often accompany or immediately follow a primary atmospherical disturbance.

PROF. DR. JOHAN HJORT publishes in *Naturen* a more or less popular *résumé* of some of the recent physical and biological researches in the Norwegian Sea. The most important work not published before consists of a discussion of two extremely valuable sets of temperature and salinity observations made between Norway and Iceland during March and April 1897. These serve to show the form and extent of the cold streams from the east of Iceland at a time when it is rarely possible to get any information, precisely the time when that information is of the highest importance.

M. E. A. MARTEL gives, in the *Comptes rendus de la Société de Geographie*, a summary of his work in Speleology during 1896. Six series of caverns were explored in France, two in the Island of Majorca, and the famous Salitre grotto in Catalonia. The Foiba de Pisino in Istria, visited in 1893, was re-examined, and some remarkable observations made on the changes produced in a subterranean lake by continued heavy rains. Under certain conditions the hydrostatic pressure in the underground syphon feeding the Foiba must amount to at least seven atmospheres, doubtless producing important mechanical and chemical changes.

DR. RUDOLF ZUBER, professor of geology in the University of Lemberg, has recently published a map of the petroleum region of Galicia, with a paper, in the German language, on the economical geology of the district. As he points out in the introduction to his paper, the region is one of surpassing geological interest and difficulty, while the language offers a greater barrier, both to travel and to a study of the literature, than is the case in many regions much further afield. Dr. Zuber's paper is therefore all the more welcome. It contains a classification of the oil-bearing strata based upon local characteristics, which amply serves the purposes of the local industry without committing itself upon the much more difficult question of their precise age.

IN a previous note in NATURE (p. 205), attention was called to Dr. Giovanni Vailati's studies on the statical notions of Archimedes. We have now received a reprint of a further paper by the same writer (*Atti della R. Accademia delle Scienze di Torino*, xxxii.), dealing with the "Principle of Virtual Work from Aristotle to Hero of Alexandria." From an examination of the *Mechanika Problemata* of Aristotle, the *Baroulkos* of Hero, and a Latin thirteenth century manuscript, *De ponderibus*, attributed to Giordano Nemorario, it appears that this principle, though commonly supposed to have been discovered about the end of the fifteenth century, was in reality known to the Greeks. In the work of Hero, Dr. Vailati finds not only distinct statements of the relations between forces and the displacements produced by them, but also applications of the principle to various machines, including pulleys. From this evidence the author attributes to the Greeks a knowledge of the subject considerably in advance of that evinced by the sixteenth-century writers on statics.

A PHOTO-VOLTAIC theory of photographic processes forms the subject of a lengthy investigation, by H. Luggin (*Zeitschrift für physikalische Chemie*, xxiii. 4). It was shown by Becquerel, in 1839, that the haloids of silver are capable, under certain conditions, of giving rise to photo-voltaic currents; and Herr Luggin finds a close connection between these currents and the decompositions which give rise to photographs. A remarkable feature is the reversal of the voltaic current which occurs when a certain potential has been reached, a consequence of which is that the same electrode is capable, according to circumstances, of giving rise to currents of opposite signs, and these Herr Luggin distinguishes as "normal" and "solarisation currents." The former are the more susceptible to blue, and the latter to yellow light. The whole investigation tends to throw light on the much-debated theories of photographic action, by showing that both the latent picture of photographic negatives and the visible transformations of the printing-out process have their counterpart in definite photo-voltaic phenomena.

AN interesting account of the earthquake of Aïdin (Asia Minor) on August 19, 1895, is given by Dr. G. Agamennone in Gerland's *Beiträge zur Geophysik*. The epicentre is situated at or close to the village of Imamkeuy, which is 6 km. east of Aïdin, and the majority of damaged buildings lie within an area about 50 km. long and 20 km. broad, the longer axis of the area being roughly parallel to the valley of the Menderes. The disturbance was registered by the Vicentini microseismograph at Padua (1570 km. from the origin), and the horizontal pendulum at Strassburg (2010 km.). The usual secondary phenomena, such as landslips, fissures in the ground, and the derangement of the underground water-system, occurred in the epicentral area; and some of the landslips gave rise to thick clouds of dust, which hung in the air for several hours, and were then carried by the wind to the south side of the valley and deposited on the adjoining mountains.

WE have heard often enough that loud and continued explosions produce rain, and the recollection of rain-making experiments based upon this apparent connection is still with us. Now comes a report from Mr. Germain, United States Consul at Zürich, on the prevention of hailstorms by the same means that have been used to encourage a downfall of rain. It appears that Mr. Albert Stiger, burgomaster of Windisch-Freistritz (Lower Steirmark, Austria), owns extensive vineyards situated on the southern slopes of the Bacher Mountains, a locality often visited by destructive hailstorms. To protect his vines from hail, he decided to try the shooting or explosive system to scatter the clouds and drive away approaching hail or heavy rain storms. Six stations were therefore erected on the six most prominent summits surrounding the locality, and commanding a territory of about two miles in extent. These stations sheltered ten heavy mortars each. Upon the slightest indication of a storm the mortars were immediately manned and loaded with 120 grams of powder each—about 4¼ ounces—and shooting commenced simultaneously and continued regularly out of the sixty mortars until the clouds were scattered and the storm had blown over. These experiments were anxiously watched by the citizens of Windisch-Freistritz last summer. Threatening black clouds made their appearance over the summits of the Bacher Mountains; at a given signal all the mortars were fired off, and the continuous detonations in a few moments caused a sudden reaction in the movements of the clouds. It is said that the cloud opened up funnel-like, the mouth of the funnel began to rise in the form of consecutive rings, expanding gradually until all of the cloud scattered and entirely disappeared. There was no hail, or even a sudden downpour of rain. The same experience was gone through six times during the summer, and proved a successful preventive in each case. We await the views of Austrian meteorologists upon these experiments; meanwhile, rain-makers who have put their trust in explosions must hide their diminished heads before the rain-dispersers.

IT has long been known that in the Pondicherry district of Peninsular India there occur Cretaceous rocks with a peculiar fauna, but though studied by such palæontologists as Forbes, d'Orbigny, and Stoliczka, the exact horizon of these beds has remained uncertain, they having been variously placed in the lower, the middle, and the upper parts of the Cretaceous system. This question may be taken as finally settled by Dr. F. Kossmatt (*Records Geol. Survey India*, xxx. 2, May 1897), who, applying the increased modern knowledge of the succession of life-forms in the Cretaceous to these beds, divides them into three divisions, of which the two lower represent the Upper Senonian (highest part of the English chalk) and the upper the Danian. The general interest of Dr. Kossmatt's paper lies, however, in the side-issues which it raises. Similar beds are known in Natal, Madagascar, Assam, Borneo, Yesso, Vancouver and Quiriquina Island, Chili. The similarity of the fauna in these beds shows the Pacific Ocean to have formed a well-defined province in Cretaceous times, separated by a barrier from the Mediterranean Ocean which extended through Europe and Central Asia. Somewhere in the Atlantic area, however, this barrier was imperfect, and a migration of Pacific forms into the Mediterranean took place, and a reverse migration to a smaller extent. By a careful study of these forms, Dr. Kossmatt arrives at a number of interesting conclusions: (1) The time required for the dispersal of a species was insignificant beside the time required for a measurable amount of sedimentation, so that in this case homotaxis means contemporaneity. (2) As the Ammonites were dispersed, they underwent definite specific changes, so that their wide distribution as fossils cannot be explained as the result of the flotation of their *dead* shells, as has been suggested by Dr. Walther. (3) The Ammonites seem to have possessed greater capacity for distribution than other groups. (4) The appearance of a new fauna in several cases coincides, everywhere, with an overlap, indicating an extension of the ocean over the land-surface: this repeated "positive displacement" of shore-lines is as characteristic of the Cretaceous all over the world, as the opposite displacement is of the beginning of the Tertiary; the Pondicherry beds, for example, rest directly on the Archæan crystallines of the Peninsula.

THE latest number of the *Journal* of the Asiatic Society of Bengal (vol. lxv. part II. No. 1, 1897, p. 345) is entirely taken up with the ninth descriptive catalogue of "Materials for a

Flora of the Malayan Peninsula," by Dr. George King, F.R.S. The publication of these very valuable contributions to botanical science was commenced more than seven years ago, but pressure of other work has prevented Dr. King from making as rapid progress as he desired. In the present part the account of the Calyciflorae is begun, and it is hoped that one more contribution similar in size to that just published will suffice to complete the Calyciflorae, and bring the whole series about half-way towards completion.

DURING the Norwegian North-Atlantic Expedition (1876-78), Prof. G. O. Sars collected from the surface a quantity of plankton containing many algæ, especially Diatoms. He described the most characteristic forms, and early last year handed over the samples for more detailed study to H. H. Gran, whose description of the material has now been published in Memoir xxiv. of the "General Report of the Norwegian North-Atlantic Expedition" (Christiania: Grondahl and Sons), printed in both Norse and English. The study of the material shows that the water of the Atlantic is especially characterised by *Chætoceros decipiens*, *atlanticum*, *boreale* and *Brightwellii*, and by several *Rhizosolenia* species. The water of the Polar Sea during summer is characterised by *Chætoceros furcellatum*, *Fragilaria oceanica*, and *Thallassiosira* species. From the contents of the samples, however, no decided boundary could be drawn, either because the ocean currents mix to a certain extent with one another, or because the Diatomaceæ have the power of rising or sinking from one stratum of water to another, independently of the currents. Mr. Gran states that he has obtained evidence which clearly points to the occurrence of the latter possibility.

THE following are among noteworthy papers and other publications which have been received during the past few days:—The letters exchanged between the two mathematicians Jakob Steiner and Ludwig Schläffi from the year 1848 to 1856 are printed in the *Mittheilungen der Naturforschenden Gesellschaft in Bern* (1896), edited by Prof. J. H. Graf.—Mr. Bernard Quaritch has just issued two catalogues (Nos. 170, 172) of scientific books, and Transactions of learned societies, offered for sale by him. We notice in the list a set of *Challenger* Expedition Reports for sale for 67*l.* 10*s.* Scientific book-buyers and librarians should certainly see Mr. Quaritch's catalogues.—Part v. of "Fresenius' Quantitative Analysis" (vol ii.), translated by Mr. Chas. E. Groves, F.R.S., has just been published by Messrs. J. and A. Churchill.

THE additions to the Zoological Society's Gardens during the past week include a Huanaco (*Lama huanacos*, ♀) from Bolivia, presented by Mr. W. J. Huxley; a —— Mouse (*Phyllotis griseoflavus*), two Chimachima Milvagos (*Milvago chimachima*), three Pileated Song Sparrows (*Zonotrichia pileata*), three Yellowish Finches (*Sycalis luteola*), two Bay Cow Birds (*Molothrus bodius*), a Yellow Troupial (*Xanthosomus flavus*) from Argentina, three West African Love Birds (*Agapornis pullaria*) from West Africa, presented by Mr. E. A. Fitzgerald; a Malabar Squirrel (*Sciurus maximus*) from India, presented by Mr. J. E. Summers; two Rough-legged Buzzards (*Archibuteo lagopus*), European, presented by Mr. H. W. Feilden; a European Tortoise (*Emys orbicularis*) European, presented by Mr. Duncan Dickens; eleven Green Lizards (*Lacerta viridis*), two Sand Lizards (*Lacerta agilis*), a Wall Lizard (*Lacerta muralis*), European, presented by Mr. C. W. Tytheridge; a Crested Porcupine (*Hystrix cristata*), three White Storks (*Ciconia alba*), a Greater Black-backed Gull (*Larus marinus*), a Herring Gull (*Larus argentatus*), a Common Night Heron (*Nycticorax griseus*), two Buzzards (*Buteo vulgaris*), European, two Ypecaha Rails (*Aramides ypecaha*) from South America, deposited; a Barbary Wild Sheep (*Ovis tragelaphus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

DEDICATION OF THE YERKES OBSERVATORY.—The formal dedication of the Yerkes Observatory will take place on October 21-22, and not on October 1, as previously announced. In connection with the dedication, a series of conferences on astronomical and astrophysical subjects will be held at the observatory on October 18, 19, 20, and 21. The provisional programme for these meetings is published in the August number of the *Astrophysical Journal.*

SOUTHERN DOUBLE STARS.—Profs. W. H. Pickering and S. I. Bailey have taken advantage of the steady air of Arequipa, and the consequent good definition, to search for close double stars in the southern skies. All the stars of the sixth magnitude and brighter, south of declination −30°, have been examined for close companions, with the 13-inch Boyden telescope. Nearly one hundred and fifty stars were thus found to have companions at distances not exceeding thirty seconds of arc, not counting stars already announced as double in the catalogues of Herschel and Russell. The numbers of these stars in the Argentine General Catalogue are recorded in *Harvard College Observatory Circular*, No. 18.

VARIABLE STARS IN CLUSTERS.—The important fact that a large number of individual stars in certain globular star clusters are variable, sometimes to the extent of two magnitudes or more, was announced in *Harvard College Observatory Circular* (No. 2) in November 1895 (see NATURE, vol. liii. p. 91), and was again referred to in May 1896 (NATURE, vol. liv. p. 108). A *Circular* (No. 18) just received from the observatory, announces that Prof. S. I. Bailey has found many more of these, bringing their total number up to 310. The greatest number of variables occur in the cluster No. 5272 in the New General Catalogue (Messier 3), as many as 113 stars in this cluster having been found to fluctuate in light. In N.G.C. 5904 (Messier 5), 63 stars have been proved to be variable, and in N.G.C. 5139 (ω Centauri) 60 stars appear to undergo light-changes. It is remarkable that while in the cluster Messier 3 about one-ninth of the stars are variable, in other clusters, for instance the great cluster in Hercules (N.G.C. 6205), not a single variable was found out of nearly two thousand stars examined.

THE MAGNITUDES OF THE ASTEROIDS.—An interesting history of the asteroids and the questions to which they give rise, is given by Herr G. Huber in the *Mittheilungen der Naturforschenden Gesellschaft in Bern* for the year 1896. The mean magnitude at opposition of the first four hundred minor planets are tabulated in groups of fifty as follows, the column marked Mag. 8 including asteroids of magnitudes 8 to 8·9, while the column marked Mag. 9 includes all from magnitude 9 to mag. 9·9, and so on for other magnitudes.

Numbers of asteroids.	Brighter than Mag. 8	Mag. 8	Mag. 9	Mag. 10	Mag. 11	Mag. 12	Fainter than Mag. 12
1- 50	2	7	17	15	7	2	—
51-100	—	—	2	19	23	5	1
101-150	—	—	—	15	27	8	—
151-200	—	—	1	4	20	20	5
201-250	—	—	—	3	18	17	12
251-300	—	—	—	1	7	13	29
301-350	—	—	2	2	8	21	17
351-400	—	—	—	2	4	13	31
Total ...	2	7	22	61	114	99	95

The table shows clearly that the asteroids discovered in recent years, namely those from No. 200 to No. 400, are mainly of the twelfth magnitude, or even fainter than that.

A NEW NEBULA PHOTOGRAPH.—A brilliant picture of the nebula Herschel V 15 Cygni (No. 6992 in the New General Catalogue), reproduced from a photograph obtained by Dr. Isaac Roberts, F.R.S., with an exposure of 2h. 55m., appears in the September number of *Knowledge*. The nebula is a wave-like brush of light, measuring about eighty minutes of arc in length,